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26 October 1955

MEMORANDUM FOR: THE RECORD

VIA : [redacted] 25X1

SUBJECT : Work under way at [redacted] of interest to APD 25X1

I. Collection Program

1. [redacted] outlined to the undersigned a proposed method of electronically analyzing an optical image with the purpose of automatically differentiating between one type of object and all others. 25X1

2. [redacted] is conducting experimental work in an attempt to verify this method. The experiment demonstrates the principle. In a conducting fluid such as salt water, a plain metalic image or shape is immersed and held at a constant voltage with respect to a conducting band around the circumference of the bath. In this way voltage gradients are established between the metal object and the wall of the container. A search probe is then placed in the solution and made to travel in a circular path concentric to the container and outside the shape of metal. The voltage is plotted versus the angular position of the probe. The graphic results of this scanning are compared for objects of various shapes and sizes. It is hoped that a correlation can be established between the shape of the object and the shape of the resulting curve. 25X1

3. If the experimental work is successful, it is hoped that a refinement of the scheme, perhaps electronic scanning of a photo-sensitive surface on which the target is imaged, can be used in the collection program for monitoring submarine traffic through canal locks.

II. Infra-red Surveillance

1. [redacted] has developed an infra-red viewer called an Evaporograph. One complete evaporograph was purchased by CIA and is now at TSL. Apparently this purchase was a year or two ago. [redacted] of TSL visited [redacted] for training in the use of the instrument. 25X1 25X1

[redacted] 25X1

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2. [redacted] expressed the desire to revive interest in the device and test it for operational use. He suggested that the evaporograph at TSL be brought up to APD and a test program be initiated. 25X1

3. An evaporograph was demonstrated to the undersigned. The principle of operation lies in the effect heat has upon the rate of condensation of an oil film on a membrane. An infra-red image is formed by a concave mirror on a thin transparent membrane. The membrane is in an evacuated chamber containing oil vapor. The oil is initially completely evaporated from the membrane by means of an auxiliary lamp. Then the lamp is moved away and the infra-red image is allowed to fall on the membrane. The membrane is viewed with a lens system and as oil condenses on the membrane a color change due to interference of light by the oil film is observed. The presence of the IR image is sufficient to change the rate of condensation of oil to the extent that the image can be seen as a contrast of color. The device is sensitive enough to show temperature differences of 2° F on the object.

4. The device is an odd shaped box roughly 12" x 8" x 6" mounted on a tripod. On the floor a standard laboratory vacuum pump is required for operation and as part of the complete instrument. The device is clumsy and very slow in operation (4 seconds to see a strong image is considered good). It has at least one major advantage over other devices, however. This is sensitivity. No other device can compare with this in sensitivity. It can pick out an automobile that has been run recently from a large group, or show what rooms of a house are heated, etc.

5. The undersigned has asked [redacted] of TSL to check with [redacted] on the status of the evaporograph they possess. 25X1

25X1

[redacted]
TSS/APD

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